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(58) Field of search
A6M

(54) Exercise apparatus

(57) The apparatus has a base, a pair of rear members 28 extending upwardly and inwardly to a joint 30, a cantilever member 32 extending forwardly from the joint, vertical guide means 44, 46, and a glide assembly 60 having a plurality of selectable weights 54 mounted thereon. A handle bar 18 is attachable to the glide assembly and various cables and sheaves can be used to raise the glide assembly.

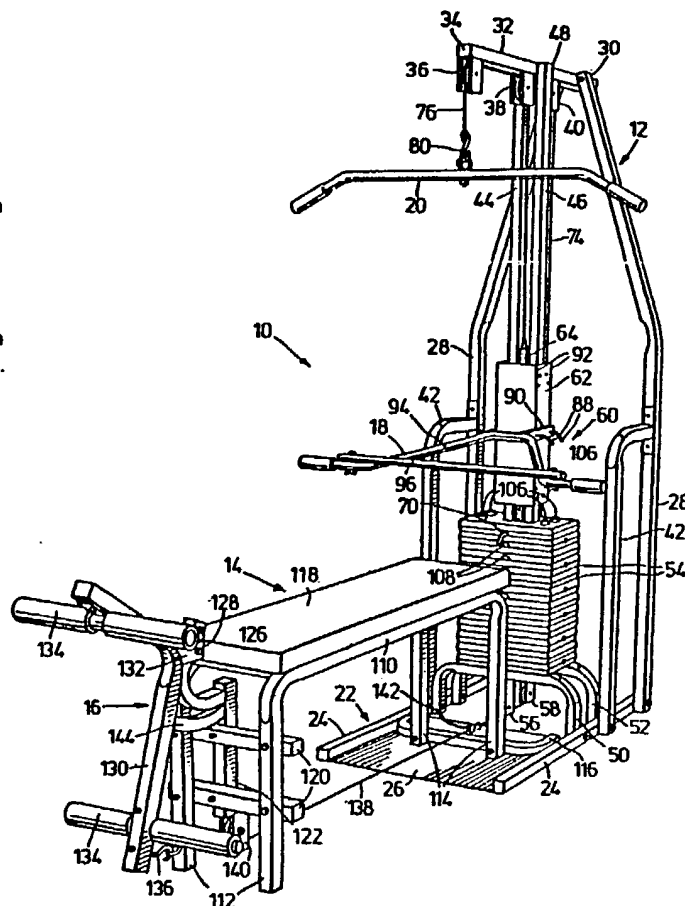


FIG. 1

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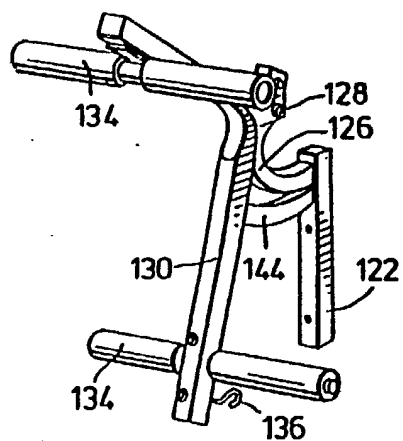


FIG. 2

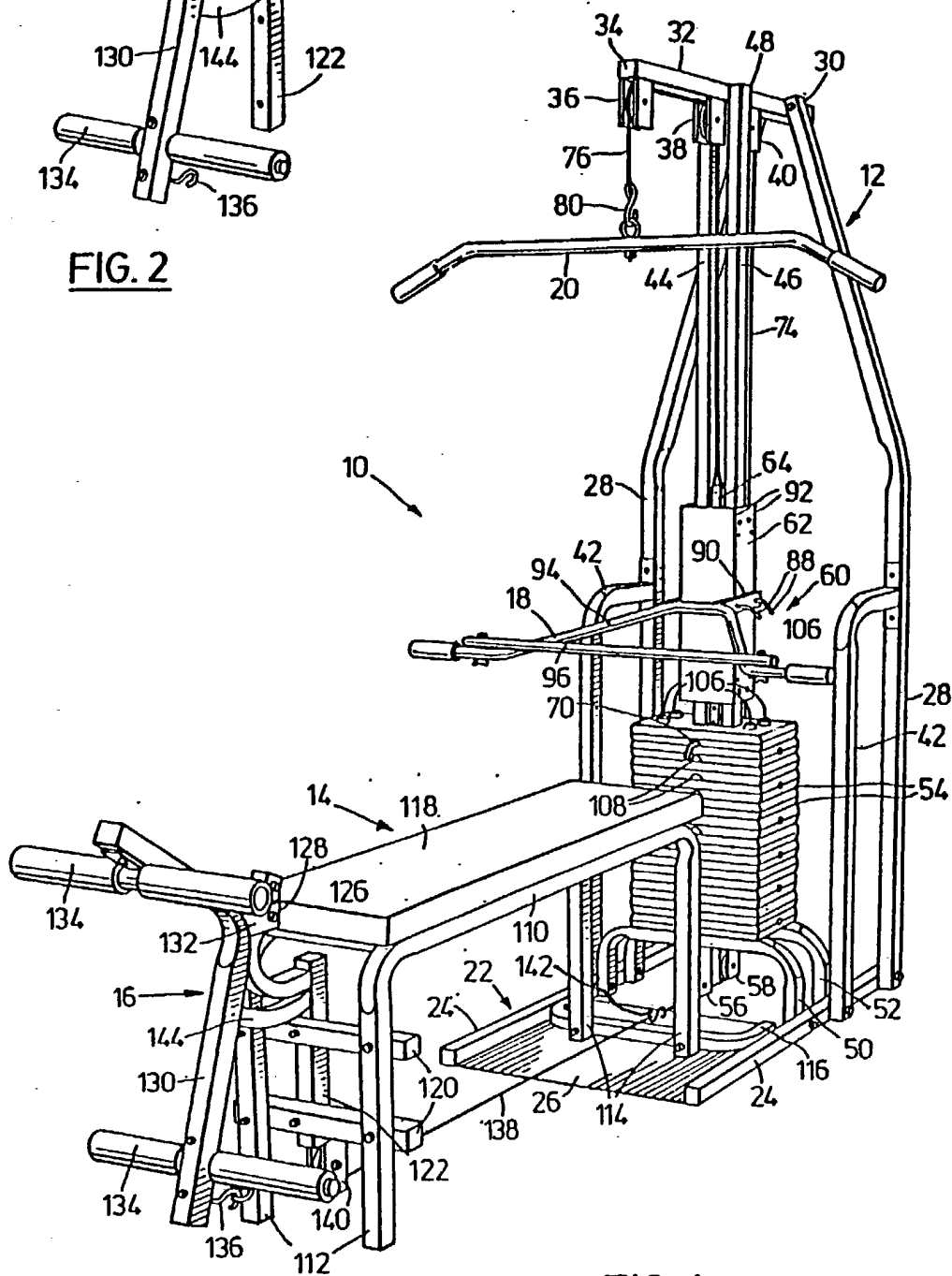
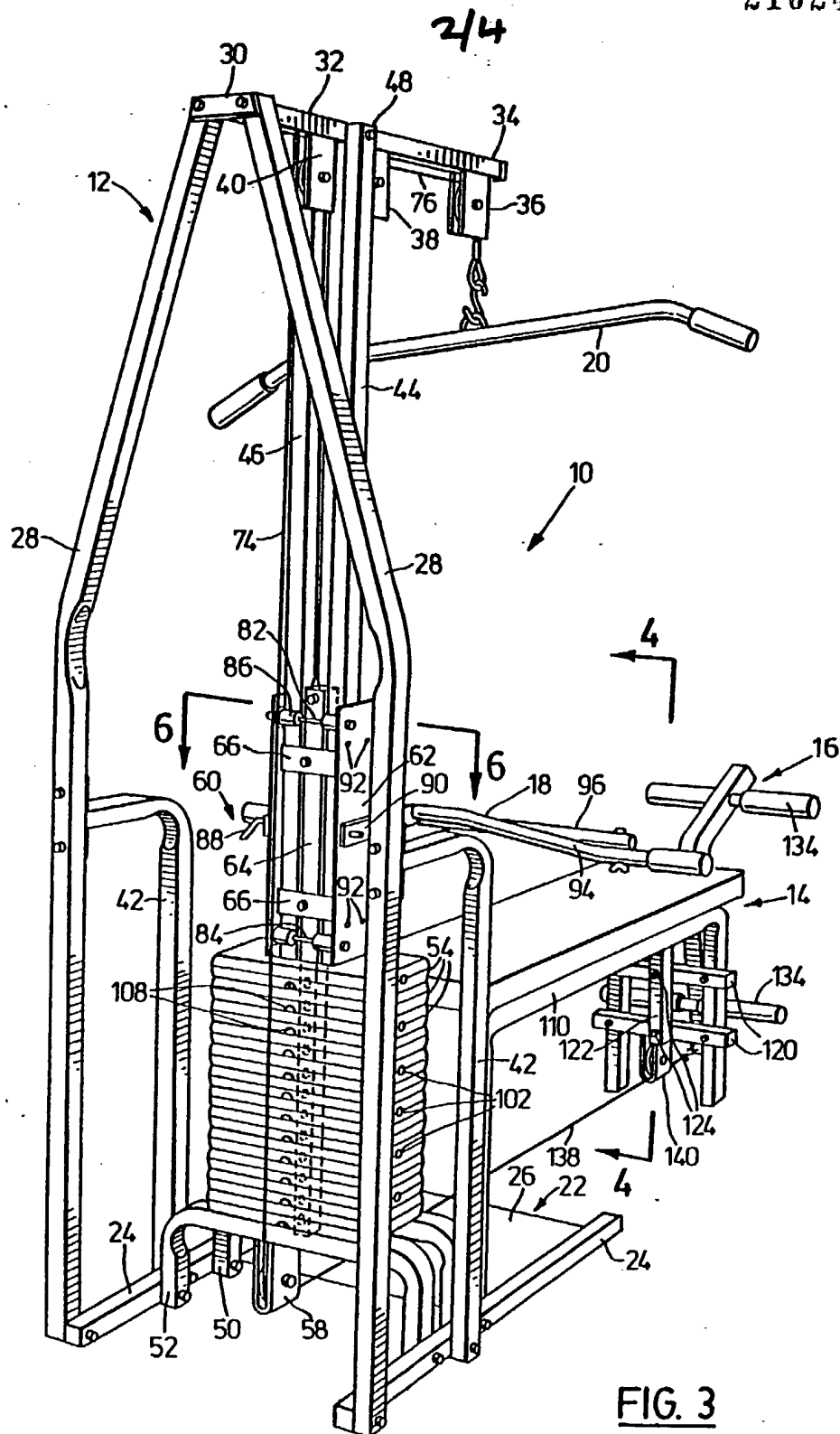
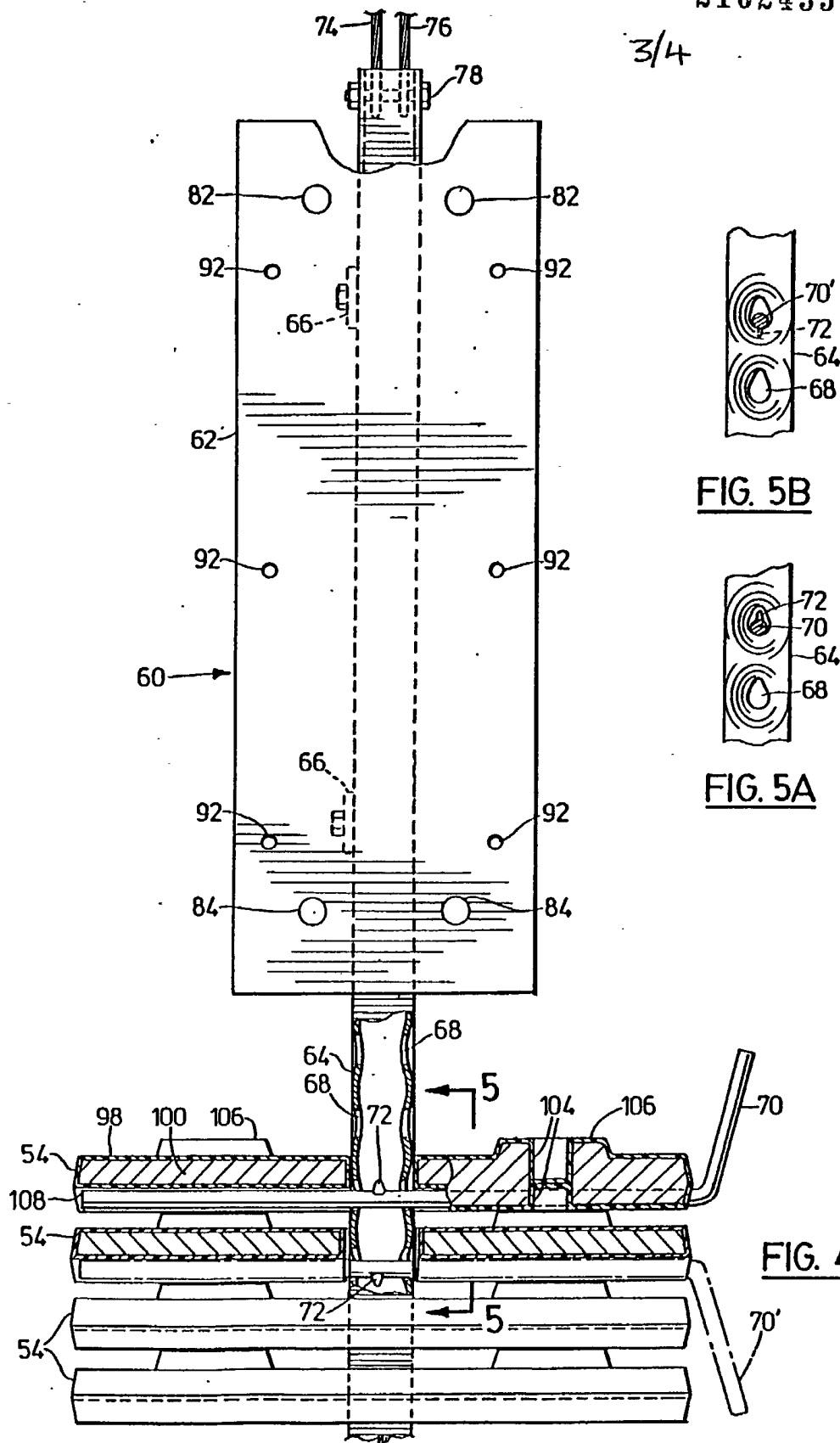


FIG. 1





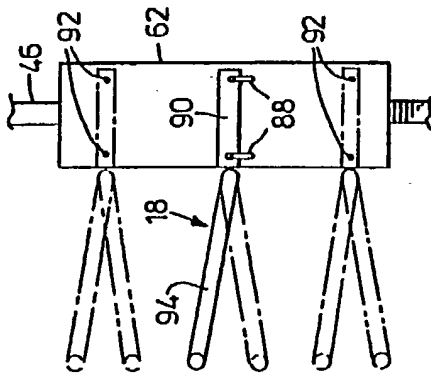


FIG. 7

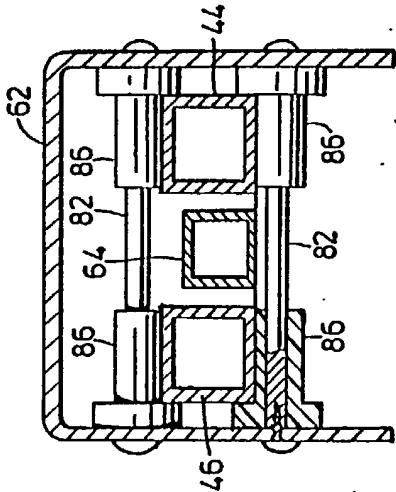


FIG. 6

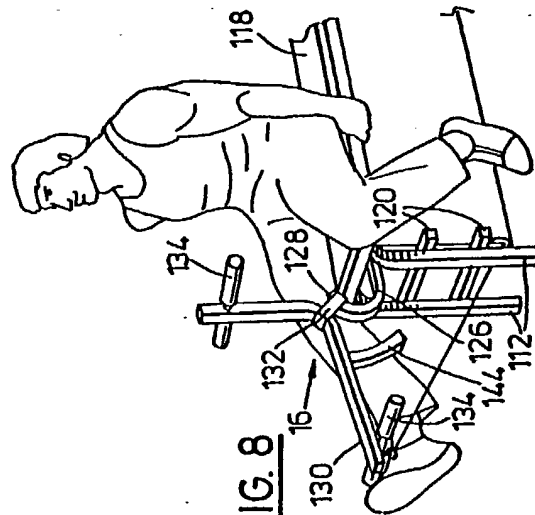
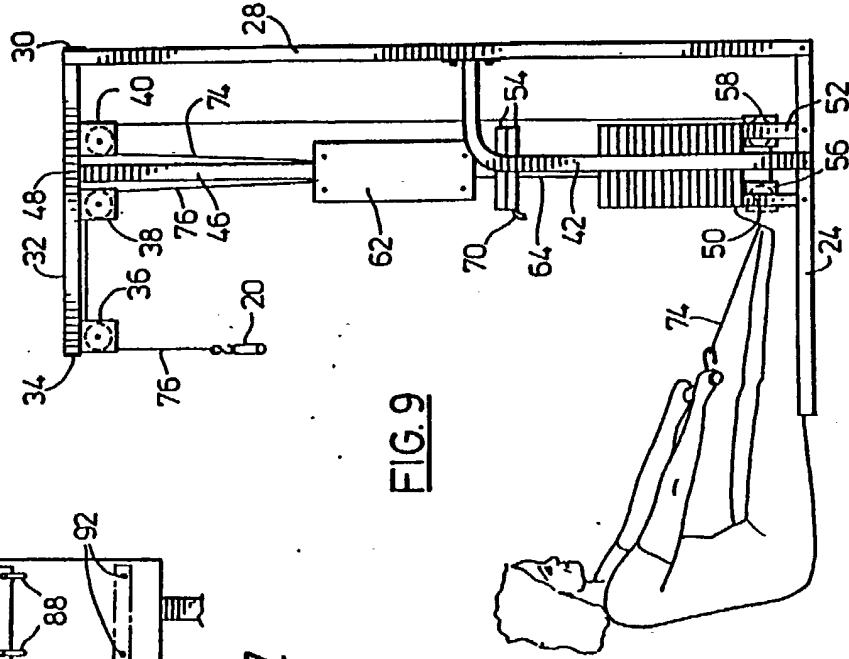


FIG. 8

FIG. 9



SPECIFICATION

Improvements in or relating to fitness apparatus

5 This invention relates to universal type gym apparatus, and in particular, to apparatus having a plurality of selectively engageable weights and various attachments connected to the weights for a person to manipulate to exercise all parts of the body.

The simplest type of weight training apparatus for use in the home is a series of barbells or dumbbells or other types of weights that a person uses to exert forces on the muscles such as by pulling, pushing, twisting or lifting the weights. Such weights are often used in conjunction with an exercise bench to enhance the variety of exercises that can be performed using the weights.

The use of separate weights, however, is often inconvenient, and there are many exercises that can not be performed with separate weights unless additional apparatus is used to direct the force of the weights where desired. The universal type gym apparatus was designed to overcome these problems. This apparatus includes a unitary set of weights with some mechanism for selecting any number of these weights to be used in any given exercise. The selected number of weights are then coupled to an attachment to be manipulated by the user in such a way that in order to move the attachment in the manner desired, the force or weight of the selected number of weights must be overcome.

Various structures have been proposed in the past for this universal type gym apparatus. A problem with some of these structures is that they must be attached to a wall for stability. Some structures are free standing, however, but they are usually very large and heavy structures and have multiples of the various attachments. This is quite suitable for commercial or institutional applications where there are several persons using the apparatus at the same time, but this apparatus is totally unacceptable for most home use because the apparatus is too large, heavy and expensive for the average home user.

Attempts have been made to scale down for home use the larger commercial gym systems, but generally these attempts have not been successful. The prior art home gym systems often lack strength or stability, and in the case of weight training equipment where up to several hundred pounds (up to 100 kilograms) of weights are used, a strength or stability failure can be extremely dangerous.

The home gym apparatus of the present invention is an extremely stable and strong structure, because the apparatus is self-aligning during assembly to avoid forces being set up in the apparatus during use that could lead to failure.

According to one aspect of the invention, there is provided home gym fitness apparatus comprising a self standing assembly having a base and a pair of rear, upright members extending upwardly and inwardly to a joint. A top horizontal cantilever member extends forwardly from a joint to a distal end. A vertical member is spaced between the upright members and the distal end, the vertical member being connected between the top horizontal member and base. A glide assembly is slidably mounted on the vertical member, the glide assembly including a plurality of weights selectively engagable therewith. A handle bar is demountably connected to the glide assembly. A plurality of sheaves are mounted on the top horizontal member, and a flexible line is attached to the glide assembly to pass around at least one of the sheaves and extend downwardly to a free end, so that a downward pull on the line free end or upward movement of the handle bar causes the glide assembly to be lifted.

According to another aspect of the invention home gym fitness apparatus is provided comprising an elongate bench having a substantially flat upper surface and a pair of downwardly extending legs at each end of the bench. A leg curl assembly is demountably connected to the bench legs at one end of the bench. The leg curl assembly includes a hinge member extending upwardly and forwardly to a pivot point at the level of the pivot point of a knee of a person sitting on the end of the bench facing the leg curl assembly. The leg curl assembly further includes a V-shaped member having an apex hingeably connected to the hinge member at the pivot point, and transverse members are attached to the V-shaped member adjacent to the distal ends thereof. Also, means are provided for biasing the V-shaped member against upward movement of the transverse members.

A preferred embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view looking from the front and from the right side of preferred embodiment of the home gym fitness apparatus according to the present invention;

Figure 2 is a perspective view of a portion of the leg curl assembly mounted on the forward end of the exercise bench shown in Figure 1;

Figure 3 is a perspective view of the apparatus shown in Figure 1, but taken from the rear and from the left side of the apparatus;

Figure 4 is a left side view of a portion of the apparatus shown in Figures 1 and 3 taken along lines 4—4 of Figure 3;

Figures 5A and 5B are partial elevational views of the central weight carrying member of the glide assembly taken along lines 5—5 of Figure 4 showing the operation of the

*weight selector pin;

Figure 6 is a sectional view of the glide assembly taken along lines 6—6 of Figure 3;

Figure 7 is a side elevational view of a portion of the glide assembly showing the adjustable mounting of the hand grip bar;

Figure 8 is a perspective view of the front end of the exercise bench of Figures 1 and 3, showing the location of the pivot point of the leg curl assembly; and

Figure 9 is a right side view of a preferred embodiment of the home gym apparatus of the present invention where it is being used without the exercise bench.

Referring firstly to Figures 1 and 3, a preferred embodiment of the home gym fitness apparatus according to the present invention is generally indicated by reference numeral 10. Apparatus 10 includes a self standing assembly 12 and an elongate exercise bench 14. Bench 14 includes a leg curl assembly 16 preferably attached to the forward or outer end thereof. Self standing assembly 12 has a hand bar 18 and a lateral bar 20 which are both also movably connected to the self standing assembly. In use, a person sits or lies on exercise bench 14 and manipulates leg curl assembly 16, hand bar 18, or lateral bar 20 to exercise various muscles of the body as will be described further below.

The self standing assembly 12 includes a base 22 having a pair of horizontal side members 24 and a flat pan 26 connected to side members 24 and extending therebetween. Pan 26 is formed of suitable sheet metal typically between 12 gauge and 16 gauge. Side members 24 are formed of square steel tubing 1-1/2 inches (3.8 cm) square, chrome plated or painted as desired. In fact, the same square steel tubing is used for the whole of apparatus 10 as indicated in the drawings. Suitable square plastic plugs (not shown) are inserted in the exposed ends of the square steel tubing members to give the ends of these members a pleasing appearance and eliminate sharp edges.

The base side members 24 extend rearwardly as shown in Figure 1 to distal ends where they are connected to rear, upright members 28 which extend upwardly and inwardly in a cathedral fashion to a top joint 30. A top horizontal cantilever member 32 is connected to rear upright members 28 at joint 30 and extends forwardly from joint 30 to a distal end 34. A plurality of blocks or sheaves 36, 38 and 40 are mounted on the top horizontal cantilever member 32. Sheaves 36, 38 and 40 are mounted between a pair of side plates welded to cantilever member 32, but any other type of sheave or block could be used as desired.

A pair of side support members 42 are connected between rear upright members 28 and the base side members 24 at a point on

the base side members 24 forward of the rear upright members 28. Side support members 42 help maintain the upright members 28 vertical and thus prevent fore and aft movement of upright members 28. Side support members 42 are shown to be of inverted L-shape, but of course, they could be straight members angled upwardly and rearwardly from base side members 24.

Self standing assembly 12 also includes a pair of parallel, spaced-apart, vertical members 44, 46 spaced between upright members 28 and the distal end 34 of cantilever member 32. Vertical members 44, 46 are connected to top horizontal cantilever member 32 at a junction 48 and extend downwardly therefrom to be connected to a pair of inverted U-shaped members 50, 52, which are in turn connected to the base side members 24. U-shaped member 50, 52 form a platform and a plurality of weights 54 rests on this platform. A pair of lower sheaves 56, 58 are mounted on the undersides of U-shaped member 50, 52.

Referring in particular to Figures 1, 3, and 4 to 6, a glide assembly 60 is slidably mounted on vertical members 44, 46. The glide assembly 60 includes weights 54 which are selectively engageable therewith, and which will be described further below. Glide assembly 60 also includes a car 62 and a central weight carrying member 64 slidably located between the pair of vertical members 44, 46. Weight carrying member 64 is attached to car 62 by being bolted to a pair of straps 66 extending between the sides of car 62. The lower end of weight carrying member 64 extends downwardly through weights 54 as seen best in Figures 3 and 4, and in the position shown in Figures 1 and 3, the bottom end of weight carrying member 64 rests on a cross member (not shown) extending between U-shaped members 50, 52. The lower portion of weight carrying member 64 is provided with a plurality of vertically spaced-apart through holes 68 through one of which a weight selector pin 70 passes, so that as the weight carrying member 64 rises all of the weights located above weight selector pin 70 are lifted by glide assembly 60.

Referring in particular to Figures 4 and 5, through holes 68 are teardrop or pear shaped and weight selector pin 70 has a transverse spike 72, so that when weight selector pin 70 is in the up position as shown in full lines in Figure 4, pin 70 may be slid into or out of any one of the through holes 68. However, when weight selector pin 70 is in the down position as represented by the chain-dotted pin 70' in Figure 4, spike 72 prevents pin 70 from sliding out of the particular through hole 68. Figure 5A shows weight selector pin 70 in the up position where it may be removed and repositioned in another through hole 68. Figure 5B shows weight selector pin 70' in

the down position where spike 72 holds pin 70 in position. This is a safety feature to prevent the accidental removal of weight selector pin 70 which would cause the sudden unloading of weights 54 from glide assembly 60. The upper end of weight carrying member 64 has a pair of flexible wire cables 74, 76 attached to it by passing a bolt through suitable eyes formed in the ends of cables 74, 76. As seen best in Figure 9, cable 74 passes upwardly around sheave 40 then downwardly around sheaves 58 and 56 to extend forwardly or to the left as seen in Figure 9, so that by pulling on the end of cable 74 glide assembly 60 and the weights carried thereby are lifted. Similarly, cable 76 passes upwardly from weight carrying member 64 around sheaves 38 and 36 and downwardly to be connected by an S-hook 80 to lateral bar 20, so that by pulling down on lateral bar 20, glide assembly 60 is again caused to be lifted.

As seen best in Figures 3 and 6, car 62 has a pair of upper axles 82 and a pair of lower axles 84, and suitable guide rollers 86 are rotatably mounted on these axles to guide car 62 and the vertical movement of glide assembly 60 along vertical members 44, 46.

Referring next to Figures 1, 3 and 7, hand bar 18 is demountably connected to glide assembly 60 by removable pins 88 passing through rear projections 90 on hand bar 18 and through the sides of car 62. Car 62 is provided with three sets of vertically spaced-apart holes 92 (see Figure 4) through which removable pins 88 may pass, so that hand bar 18 can be removably located at three different vertical positions. In fact, hand bar 18 has a generally U-shaped hand grip bar 94 which is disposed in a plane which is horizontally angularly disposed relative to vertical members 44, 46. Therefore, hand bar 18 may be turned over or rotated 180°, so that hand grip bar 94 can be located in six different positions, and by choosing the angle of inclination of hand grip bar 94 appropriately, the position of the outer ends of hand grip bar 94 can be vertically equi-spaced. As seen best in Figures 1 and 3, hand bar 18 also includes a removable cross bar 96 which may be used for performing certain exercises as desired. It will be appreciated that by lifting hand bar 18, the glide assembly 60 and the weights carried thereby are also lifted.

Referring again to Figure 4, the construction of weights 54 will now be described in detail. Weights 54 include an outer envelope 98 which is typically formed of a suitable plastic material by a blow molding process.

Weights 54 are dimensioned so that the typical weight of each of these weights is about 10 pounds (4.5kg), so that the weight of all of the weights in apparatus 10 is typically about 140 pounds (64 kg) including the weight of glide assembly 60. Envelope 98 is

filled with a suitable heavy filling material 100 such as concrete, and for this purpose suitable end plugs 102 (see Figure 3) are provided in the ends of weights 54 to fill the weights. In practice, it is difficult to completely fill weights 54, so there may be some air space adjacent to end plugs 102. For this reason, weights 54 are alternately positioned with the plug of the first weight being on the right side, the plug of the second weight being on the left side and so on. In this way the weights are evenly balanced on glide assembly 60.

The outer envelope 98 of weights 54 has opposed walls with dimples 104 projected inwardly therefrom to join approximately at the centre of the weights. This strengthens envelope 98 and prevents the walls from separating. The upper wall of each weight 54 is formed with four raised bosses or bearing pads 106, one in each quadrant on which the weights located above rest. Envelope 98 is also formed with a downwardly opening transverse groove 108 for accommodating weight selector pin 70.

Referring again to Figures 1 to 3, exercise bench 14 has a pair of inverted, U-shaped members 110 forming pairs of downwardly extending legs 112, 114 at each end of the bench. Legs 114, which are rear legs, have a rearwardly opening U-shaped foot member 116 attached thereto and foot member 116 bears against U-shaped member 50 to prevent bench 14 from being pulled into weights 54. Bench 14 also has a padded upper member 118 having a substantially flat upper surface. Legs 112, which are front legs have leg curl assembly 16 attached thereto.

Leg curl assembly 16 includes a pair of horizontal support members 120 bolted to legs 112 and a central vertical member 122 attached to support members 120 by bolts and wing nuts 124, so that the main portion of leg curl assembly 16 as shown in Figure 2 may be easily removed or demounted from bench 14.

Leg curl assembly 16 includes a hinge member 126 extending forwardly and curving upwardly to a pivot point 128. An inverted V-shaped member 130 has a pair of brackets 132 at the apex thereof for hingeably connecting the V-shaped member to hinge member 126 at pivot point 128. Padded, cylindrical transverse members 134 are attached to V-shaped member 130 adjacent to the distal ends thereof. The lower distal end of V-shaped member 130 has a hook 136, and a cable extension 138 is connected to hook 136 to pass around another sheave 140 to be connected to the end of cable 74 by a further S-hook 142. The operation of leg curl assembly 16 is best illustrated in Figure 8, where it will be noted that pivot point 128 coincides or is at the level of the pivot point of a knee of a person sitting on the end of bench 14 facing

leg curl assembly 16. The result of this is that when a person lifts his leg to raise V-shaped member 130 the transverse members 134 do not ride up the leg. It will be appreciated that weights 54 acting through cables 74 and 138 bias the V-shaped member 130 against upward movement. A stop member 144 is provided to limit the downward pivotal movement of the V-shaped member 130.

The assembly of home gym apparatus 10 includes the assembly of exercise bench 14 and the assembly of self standing assembly 12. The assembly of exercise bench 14 is straightforward and will not be described in detail. The assembly of self standing assembly 12 commences with the mounting of U-shaped members 50, 52 to base 22.

Throughout the assembly, all bolts are tightened only finger tight until all members are in position. In this way, the unit is self-aligning and final tightening maintains the proper alignment. Rear upright members 28 and side support member 42 are next assembled. Vertical members 44, 46 are then loosely attached to lower U-shaped members 50, 52. Weights 54 and glide assembly 60 are then slid unto vertical members 44, 46. Cantilever member 32 is then connected to the upper ends of rear upright members 28 and the upper ends of vertical members 44, 46. Alignment of the unit is then checked and final tightening is commenced by first tightening the bolt at junction 48. The bottom ends of vertical members 44, 46 are then tightly fastened in position as are the U-shaped members 50, 52. Top joint 30 is then tightened, thereafter the bottom ends of rear upright members 28 are tightened, and finally side support members 42 are fastened securely in position. Cables 74, 76 are then fed through the respective sheaves. Lateral bar 20 and hand bar 18 are then assembled. Exercise bench 14 is positioned and cable extension 138 is connected between cable 74 and leg curl assembly 16 to complete the assembly.

The use of home gym fitness apparatus 10 will be readily apparent to users of this type of equipment. As is apparent from Figure 9, various parts of the equipment can be removed if they interfere with the performance of any desired exercise. Another typical example of a situation where part of the apparatus would be removed would be where a person is standing on the base pan 26 lifting hand bar 18. In this case, as the glide assembly moves up, the lateral bar 20 would move downwardly, and since the distal end of cantilever member 32 is in vertical alignment with the base pan 26, the lateral bar 20 could strike the person lifting hand bar 18 so it should be removed.

Having described a preferred embodiment of the apparatus of the present invention, it will be appreciated that various modifications could be made to the structure described, but

all modifications are intended to be included within the scope of this invention.

From the above, it will be appreciated that the present invention is an easily assemblable, fully demountable apparatus. The apparatus is self-aligning and extremely sturdy, insuring maximum strength and stability, which is highly desirable in home gym apparatus.

75 CLAIMS

1. Home gym fitness apparatus comprising: a self standing assembly having a base and a pair of rear, upright members extending upwardly and inwardly to a joint; a top horizontal cantilever member extending forwardly from said joint to a distal end; a vertical member spaced between said upright members and said distal end, the vertical member being connected between the top horizontal member and the base; a glide assembly slidably mounted on the vertical member, the glide assembly including a plurality of weights selectively engagable therewith; a handle bar demountably connected to the glide assembly; a plurality of sheaves mounted on the top horizontal member; and a flexible line attached to the glide assembly and passing around at least one of said sheaves and extending downwardly to a free end, so that a downward pull on said line free end or upward movement of said handle bar causes the glide assembly to be lifted.

2. Apparatus as claimed in claim 1 and further comprising a pair of side support members connected between the rear upright members and the base at a point on the base spaced forwardly of the rear upright members.

3. Apparatus as claimed in claim 1 wherein the handle bar includes a generally U-shaped hand grip bar and means for demountably attaching said hand grip bar to the glide assembly so that the plane of the hand grip bar is horizontally angularly disposed relative to the vertical member.

4. Apparatus as claimed in claim 3 wherein the glide assembly includes means for attaching the hand grip bar thereto at a plurality of vertical positions to adjust the height of the hand grip bar.

5. Apparatus as claimed in claim 3 or 4 wherein said attachment means include rear projections formed on the hand grip bar; the glide assembly having a plurality of vertically spaced-apart holes formed therein, and removable pins passing through said projections and said holes to demountably retain the hand grip bar in position.

6. Apparatus as claimed in claim 1 wherein said weights include an outer envelope and a filling of heavy material, the outer envelope including opposed walls, at least one of said walls having dimples projecting inwardly to join the opposite wall.

7. Apparatus as claimed in claim 6 wherein said dimples are formed in each of the op-

posed walls in registration, the dimples extending inwardly to join at the centre of the weights.

8. Apparatus as claimed in claim 7 wherein
5 at least one of said opposed walls is formed with raised bearing pads for engaging an adjacent one of said weights.

9. Apparatus as claimed in claim 6, 7 or 8
10 wherein the outer envelope includes a downwardly opening transverse groove for accommodating a weight selector pin adopted to pass through the glide assembly to lift the weights with the glide assembly.

10. Apparatus as claimed in claim 2
15 wherein said base includes a pair of horizontal side members and a flat pan extending therebetween located below said top horizontal member distal end.

11. Apparatus as claimed in claim 2 or 10
20 wherein the vertical member is one of a pair of parallel spaced-apart, vertical members, the glide assembly having a central weight carrying member slidably located between said parallel vertical members.

12. Home gym fitness apparatus comprising:
25 an elongate bench having a substantially flat upper surface and a pair of downwardly extending legs at each end of the bench; a leg curl assembly demountably connected to the
30 bench legs at one end of the bench; the leg curl assembly including a hinge member extending upwardly and forwardly to a pivot point at the level of the pivot point of a knee of a person sitting on the end of the bench
35 facing the leg curl assembly; the leg curl assembly further including a V-shaped member having an apex hingeably connected to said hinge member at said pivot point and transverse members attached to the V-shaped
40 member adjacent to the distal ends thereof; and means for biasing the V-shaped member against upward movement of said transverse members.

13. Apparatus as claimed in claim 4, 6 or
45 10 and further comprising an elongate bench having a substantially flat upper surface and a pair of downwardly extending legs at each end of the bench, one pair of said legs engaging the base; a leg curl assembly demountably connected to the bench legs at the
50 other end of the bench; the leg curl assembly including a hinge member extending upwardly and forwardly to a pivot point at the level of the pivot point of a knee of a person sitting on the end of the bench facing the leg curl
55 assembly; the leg curl assembly further including a V-shaped member having an apex hingeably connected to said hinge member at said pivot point and transverse members attached to the V-shaped member adjacent to the distal ends thereof; a sheave mounted at the base of the vertical member; and said flexible line passing around said base member sheave and extending to be attached to the V-
60 shaped member remote from said apex.
65

14. Apparatus as claimed in claim 12 and further comprising stop means for preventing downward pivotal movement of the V-shaped member beyond a pre-determined limit.

- 70 15. Apparatus as claimed in claim 1, 10 or 12 wherein all members are joined together using threaded fasteners, so that the apparatus is demountable.

16. Apparatus substantially as herein described with reference to and as shown in the accompanying drawings.

17. Any novel feature or combination of features disclosed herein.

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